We claim:

1. A method for designing an alternating phase shifting mask (altPSM) for projecting an image on an image plane, the method comprising:

providing a circuit layout;

identifying a critical element of said circuit layout, said critical element having a layout dimension (LW), said layout dimension corresponding to a target image dimension in the image plane;

providing a relationship between phase shape width and said target image dimension;

selecting an optimal phase shape width so that said relationship has an optimal value; and

generating a phase shape disposed adjacent to said layout dimension wherein said phase shape has said optimal phase shape width.

2. The method of claim 1 wherein said relationship comprises across-chip line width variation (ACLV), and said selecting further comprises minimizing said ACLV.

3. The method of claim 2 wherein said providing a relationship further comprises providing at least one distribution of process errors in at least one lithographic parameter and computing a set of ACLV realizations for said target image dimension and computing the standard deviation of said ACLV realizations for said target image dimension.

4. The method of claim 3 wherein said at least one lithographic parameter is selected from the group consisting of dose, focus, lens aberration, mask critical dimension error, transmission error,

phase error, mask manufacturability error, and a combination thereof.

5. The method of claim 4 wherein said at least one distribution comprises a gaussian distribution.

6. The method of claim 1 wherein said relationship comprises process window, and said selecting further comprises maximizing said process window.

7. The method of claim 1 wherein said providing a relationship comprises providing a lookup table having optimal phase shape widths for a range of target image dimensions stored therein.

8. The method of claim 1 wherein said relationship comprises a requirement that said optimal phase shape width be about 0.8-1.2 x LW.

9. A computer program product comprising a computer readable storage medium having stored therein instructions executable by the computer for performing a method for designing an alternating phase shifting mask (altPSM) for projecting an image on an image plane, the method comprising:

providing a circuit layout;

identifying a critical element of said circuit layout, said critical element having a layout dimension (LW), said layout dimension corresponding to a target image dimension in the image plane;

providing a relationship between phase shape width and said target image dimension;

selecting an optimal phase shape width so that said relationship has an optimal value; and

generating a phase shape disposed adjacent to said layout dimension wherein said phase shape has said optimal phase shape width.

10. The computer program product of claim 9 wherein said relationship comprises across-chip line width variation (ACLV), and said selecting further comprises minimizing said ACLV.

11. The computer program product of claim 10 wherein said providing a relationship further comprises providing at least one distribution of process errors in at least one lithographic parameter and computing a set of ACLV realizations for said target image dimension and computing the standard deviation of said ACLV realizations for said target image dimension.

12. The computer program product of claim 11 wherein said at least one lithographic parameter is selected from the group consisting of dose, focus, lens aberration, mask critical dimension error, transmission error, phase error, mask manufacturability error, and a combination thereof.

13. The computer program product of claim 12 wherein said at least one distribution comprises a gaussian distribution.

14. The computer program product of claim 9 wherein said relationship comprises process window, and said selecting further comprises maximizing said process window.

15. The computer program product of claim 9 wherein said providing a relationship comprises providing a lookup table having optimal phase shape widths for a range of target image dimensions stored therein.

16. The computer program product of claim 9 wherein said relationship comprises a requirement that said optimal phase shape width be about 0.8-1.2 x LW.

17. An alternating phase shifting mask for projecting an image on an image plane, the mask comprising:

a layout pattern having at least one element having a layout dimension, said layout dimension corresponding to a target image dimension in the image plane;

a phase shape having a phase width, wherein said phase shape is disposed adjacent to said layout dimension, and wherein said phase width is selected in accordance with a relationship between said phase width and said target image dimension.

18. The mask of claim 17 wherein said relationship comprises across-chip line width variation (ACLV), and said phase width is selected so that ACLV is minimized.

19. The mask of claim 17 wherein said relationship comprises process window, and said phase width is selected so that said process window is maximized.

20. The mask of claim 17 wherein said phase width is about 0.8-1.2 times said layout dimension.